

Engineering & Computer Science BITS

ENGINEERS & COMPUTER SCIENTISTS OF TOMORROW

"Heading into the conference with little or no understanding of what exactly an engineer does, most of us left with a far greater understanding and interest in the field."

- Secondary V Students of Beaconsfield High School

On January 19, eighty women students from five Montreal area high schools (Beaconsfield, John Rennie, Laurenhill, Queen of Angels and Riverdale) attended the Faculty of Engineering and Computer Science Engineers of Tomorrow Conference. They were welcomed by Dean Taddeo and then spent the morning touring the Faculty. The students made pens, worked the milling machines, saw award winning SAE vehicles, played with computers and learned how our new library will hold up in the event of an earthquake. Most of the tour guides and demonstrators (about 30 of them)



were undergraduate engineering students, both men and women. "We all feel that it is necessary to show these kids what we do here, because they really have no idea," said Kim Rokas and Brenda Lord, the conference organisers.

After lunch and a video about student life in the Faculty, the girls moved to the Faculty

Club Lounge to hear several speakers. Dr. Rose Sheinen, Vice-Rector Academic, opened the afternoon by speaking about her experience as a women scientist. She was followed by the keynote speaker, Martine Corriveau-Gougeon, General Manager of Acquisitions at Bell Canada, who spoke to the students in a question and answer format about her career, and how she balances it with a family. The day ended with student presentations from each department.

The day was an unqualified success in introducing the young women to applied science. As they left, several of them were looking around as if they could picture themselves here in three or four years. As Dr. Taddeo told them at the beginning of the day, we would be happy to have them.

PROF. E. I. PLOTKIN - IEEE FELLOW

Congratulations to Professor Eugene I. Plotkin, who was named an IEEE (Institute of Electrical and Electronic Engineers) Fellow by the IEEE Board of Directors at its November 1993 meeting. The award is presented in recognition "For contributions to non-linear-structural and time-varying systems with applications to parameter estimation and rejection and enhancement of signals."

According to IEEE by laws, no more than one-tenth percent of the total membership of IEEE may be elected to the Fellow-grade in any year, adding distinction to those who receive the honour.

Over the past 30 years, Dr. Plotkin has enjoyed a distinguished career in Signal Processing. He has taught at The Institute of Communication Engineering in St. Petersburg, Russia, Ben-Gurion University in Israel, Pennsylvania State University and the City College of the City University of New York, both in the United States. For the past eight years he has made his home in Montreal, teaching in the Department of Electrical and Computer Engineering at Concordia. His main interests are in the areas of Nonlinear and Time-Varying Signal Processing; Structural Signals Processing; Adaptive and Nonlinear Filtering; and, Nonuniformly Distributed Sampling Strategies. By using an innovative structural approach as applied to signal representation, he was able to develop theory and to design a new type of filters whose response does not depend (invariant) on a signal's parameters: Parameter Invariant Filtering. Dr. Plotkin is the author or co-author of over 120 technical papers which have appeared in refereed journals and conference proceedings. He has also written several books on different aspects of signal processing, communications and analog/digital filtering.



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CERCA

CENTRE DE RECHERCHE EN CALCUL APPLIQUÉ

In March 1988, Wagdi Habashi (Mechanical) met with about 30 colleagues, most of them in the aerospace industry, to propose the creation of a centre of excellence in computational fluid dynamics (CFD). This proposal was received with interest by several people. During a subsequent meeting organized by André Biron (Associate Director of CERCA), it drew the attention of Georges Michaud, an astrophysicist at the Université de Montréal (and now Director of CERCA), because both the flow of gases around a star and around an airplane engine can be modelled using the same basic equations. From these initial meetings, a group of 12 companies, 22 universities and 100 researchers entered the national competition for Networks of Centres of Excellence with an application called CANADF (Calcul Numériques en Aérodynamiques et en Dynamiques des Fluides). Of more than 150 applications only 15 went on to become Centres of Excellence. CANADF was among those visited, an indication that the proposal was given serious consideration by the federal government, it was not, however, retained for funding. It was a disappointing setback, that came with a valuable lesson - the group had been too large and widespread.

The Université de Montréal then entered into negotiations with the provincial government on behalf of some of the original group members at Concordia, École Polytechnique and McGill. Quebec City was interested in funding the creation of a research centre in computational methods and, unlike the Networks of Excellence grants, the money from the province could be used only for infrastructure. In January 1992, CERCA was opened. The Quebec government con-

tribution was 12.4 million dollars over a five-year period between 1992 and 1997. Each of the founding universities agreed to increase its expertise in the field of computational methods over that same period by hiring a certain number of new professors. Three of these posts will be at Concordia.

CERCA's aim is to bring together the best Québec minds in fundamental and applied computational methods in order to increase technology transfer between universities and industry. In this way it hopes to improve the performance of both Québec industries and universities in a highly competitive field.

"Computational methods" is a relatively new area which can be used to the benefit of many fields of study. Some of CERCA's research time is, thus, devoted to developing new technologies associated with computational methods. In applied research, CERCA has two main thrusts, CFD and chemistry. Chemistry focuses on molecular modelling of chemical interactions. In particular, the centre hopes to collaborate with pharmaceutical companies in their testing of new drugs for AIDS patients. Research related to CFD includes: flow in gas turbine engines, flow in hydraulic turbines, flow around airplanes, stellar hydrodynamics and flow of particles, thermophysical processes and ocean currents. These projects mirror the interests of the centre's eight individual members and five associate members, and often involve industry members of CERCA: Alcan International, Bio-Mega, Bombardier-Canadair, CANMET, Environment Canada, GE Canada, GEC Alsthom Électro-mécanique, Hydro-Québec, Pratt & Whitney Canada and Spar

Aérospatiale.

Two years into its mandate CERCA is doing very well. Its computational power is impressive. The centre has 16 CPU Silicon Graphics Challenge parallel computer and about 40 workstations of varying power on site. For really big jobs it buys time on Environment Canada's NEC SX3 (a 20 gigaflop machine - the fastest computer in the world), or on one of two Crays at the Pittsburgh Supercomputer Centre. CERCA also holds weekly seminars for scientists and graduate students given by specialists in applied computational methods, and an annual international workshop on a specialized topic. Right now CERCA is exploring the creation of a consortium of airlines, aircraft engine manufacturers, pilot associations, universities and the National Research Council to look at icing problems on aircraft and gas turbine engines.

Dr. Wagdi Habashi is the Director - Industry of CERCA director. If you would like to find out more about the research centre, he can be reached at 369-5202.

**Reduce, Reuse,
Recycle and
Recover.**

**Please do your
part,
recycle this copy of
Bits.**

FACULTY FACES

Dr. Maria Elektorowicz - Department of Civil Engineering

This fall the Department of Civil Engineering will offer its undergraduate students a new option in environmental engineering. Dr. Maria Elektorowicz is one of the professors who will get the program off and running.

Born and raised in Poland, Dr. Elektorowicz attended Warsaw Technical University. While studying engineering, she also ran competitively, holding the Polish technical university record for the 400m for several years. She enjoyed the competition and points out that it was one of the more pleasant aspects of the Communist regime, "Everyone had free access to sports facilities. You could compete at the level your abilities allowed, and the competition in the gym prepared you for a different type of competition later in life." After finishing her Master's degree, she worked for a time as a science and technology journalist for the Trybuna Ludu, a national daily paper. Although she enjoyed journalism, her love for science was greater, and, in the late seventies, she returned to university to obtain her PhD in environmental engineering. In 1978, she was awarded a UNESCO Post-Doctoral Fellowship which she completed as a member of an international team at Lomonosov University in Moscow. Dr. Elektorowicz says that she believes the mind set which eventually brought down the USSR was alive at that time,



associate at the Geotechnical Research Centre (McGill).

Dr. Elektorowicz says the definition of "environmental engineer" is changing. "We used to look at things in isolation. If we could safely and cost-effectively remove toxic effluents from a given area, a factory for example, we had done our jobs. Our vision of the environment is now more global. It has to be." She is an organising member of the network *Réseau de recherche scientifique sur les sites contaminés*. Members of the network intend to exchange information and up-to-date developments in order to facilitate the clean up of contaminated areas within Quebec. "There is no scientific competition in this area, only cooperation. We must learn from each other because the problem is so immediate and

Faculty Faces is a regular feature of Bits, focusing on personalities within Engineering and Computer Science.

multidisciplinary." Their first focus will probably be contaminated soil, sediment and ground water. Contamination of this kind is particularly prevalent in Quebec because we have always used our rivers for waste disposal. According to Dr. Elektorowicz, "No one industry is responsible for where we are now. They all contributed in some small way to what is now a huge problem." She hopes that the network will be able to work as a neutral liaison between industry and government, so that environmental problems may be solved more easily and quickly.

Despite a few problems finding laboratory space, Dr. Elektorowicz enjoys working at Concordia. She is hoping to share her global approach with her students, both graduate and undergraduate. One of her ideas, the Industrial Waste Research Centre, has been accepted by the Advancement Office as a project for the next Capital Campaign. The Centre would bring together people from different departments, faculties and universities to look at the problem of industrial pollutants, including noise and toxic waste. Christopher Hyde, Director of Advancement thinks it is a wonderful idea, "Dr. Elektorowicz is very enthusiastic."

"We need people like her at Concordia." Dr. Elektorowicz is not so sure that her students share Mr. Hyde's enthusiasm, "My teacher evaluations for the first term were not too good," she admits. "In Poland and Algeria a professor gives very dry lectures, here we must touch the students interest in the topic. I am adjusting my style. I believe things are going better this term."

EVENTS OF NOTE

This column is compiled from information forwarded to the Communications Office by members of the Faculty Community. If you would like your event to appear in "Events of Note" please send a brief description (including date, time, place and a contact person) to H 907 c/o Dawn Wiseman.

- * At the eighth Congress of the Association québécoise pour la maitrise de l'énergie (AQME), Dr. Radu Zmeureanu (Centre for Building Studies) will give a talk entitled, Demystification and new trends in energy analysis software. The AQME Congress will be held from March 10 - 12, 1994 in Quebec City.
- * The Graduate Students' Association (GSA) will hold its third Annual Graduate Symposium on March 23, 1994. The topic for this year's gathering is "The Mainstream". All graduate students are invited to submit papers by March 14. For more information please contact Peg Tittle at 848-7900.
- * Quebec hospital receive about 1400 pints of blood each day from the Red Cross. On March 14 and 15 the Engineering and Computer Science Association (ECA) Blood Drive will help the Red Cross save lives. The students hope to collect 1000 pints over the two day event. It takes less than 45 minutes to give blood, please help them reach their goal. For more information call Christine Vieira, ECA Blood Drive Co-ordinator, at 932-5588.
- * Students from Concordia, McGill and École de Technologie Supérieure spent Saturday, February 5 at a downtown women's shelter painting, cleaning and doing general repairs. It's a tradition that dates back to 1988, which had not been practiced for a few years, but this year was revived by Eric Abadie (Industrial). All supplies and materials for the painting and repairs were supplied by the shelter. Volunteers were treated to lunch and dinner by the student associations involved.
- * A reminder to all graduate students and professors. The Faculty workshop on *Recognition of Research Contributions and Research Supervision* will be held Tuesday, February 22 from 09h00 to 16h30. Registration packages have been forwarded to all departments. If you have not yet received a package, please see your department's graduate secretary.

1994 ECSCSL AWARDS

The Engineering and Computer Science Council on Student Life (ECSCSL) Awards were created to acknowledge the outstanding contributions that have been made by certain individuals in Engineering and Computer Science to the student life at Concordia University. These awards are presented annually, when merited, to people from throughout the Faculty community: students, faculty and support staff.

Awards are given in the following categories:

- 1 Faculty Member
- 1 Staff Member - Office
- 1 Staff Member - Technical
- 2 Graduate Students
- 3 Undergraduate Students - Faculty
- 5 Undergraduate Students - one in each department

Nomination forms for the 1994 ECSCSL Awards will be available shortly. For more information call Stanley Yee at 848-7408.

Engineering and Computer Science Bits is a monthly publication of the Faculty's Communications Office, which is distributed, without charge, to the members of the Engineering and Computer Science Community.

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